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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/839,360	04/20/2001	Canfeng Lai	A5152/T39500	3118

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APPLIED MATERIALS, INC.  
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EXAMINER

HASSANZADEH, PARVIZ

ART UNIT PAPER NUMBER

1763

DATE MAILED: 07/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/839,360

Applicant(s)

LAI ET AL.

Examiner

Parviz Hassanzadeh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-11,18-20,22-39,41-45,49 and 50 is/are pending in the application.
- 4a) Of the above claim(s) 18-20,22-39,41-45,49 and 50 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

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## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election with traverse of Species 1 of group I (apparatus) in Paper No. 5 is acknowledged. The traversal is on the ground(s) that the special technical features of the elected Species 1 may be found in other non-elected Species. This is not found persuasive because the special technical features of species are patentably different from each other. For example species 2 requires a multi-wafer processing system including an internal toroidal plasma source; or other non-elected species do not require the toroidal plasma source being disposed within the processing chamber.

Claims 18-20, 22-39, 41-45, 49 and 50 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 5.

### ***Oath/Declaration***

It does not identify the citizenship of each inventor.

### ***Drawings***

The corrected or substitute drawings were received on 6/13/03. These drawings are acceptable by the Examiner.

### ***Claim Rejections - 35 USC § 102***

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claim 10 is rejected under 35 U.S.C. 102(e) as being anticipated by Mahoney et al (US Patent No. 6,432,260 B1).**

Mahoney et al teach a plasma processing apparatus including a plasma generating chamber 1 (*plasma generating plate*) comprising: two ends opening into a process chamber 2 (*a first side and a second side*) ; and a first conduit passing from the first side to the second side through a first transformer core 9 (9a) within the plasma generator plate 1 as shown in Fig. 1; and a second conduit passing from the first side to the second side through a second transformer core 9b (Fig. 2) (column 6, line 14 through column 7, line 67). The apparatus further includes an input gas port 14 in communication with the vacuum chamber and disposed at an upper part of one end of the conduit (*a third conduit passing from the first side to the second side not passing through a transformer core*) (column 6, lines 40-49).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 1, 3-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shun'ko (US Patent No. 6,392,351 B1) in view of Smith et al (US Patent No. 6,486,431 B1).**

Shun'ko teaches a substrate processing chamber (Figs. 6, 7) comprising: a chamber body 106, 108; a chamber top supporting an object 105 disposed on the chamber body 106 ; and a transformer-coupled plasma generator plate 109 disposed between the chambers 106, 108 having a plurality transformer cores 114, 116 *within* the transformer-coupled plasma generator plate and a plurality through holes 110, 112 (*conduits*) formed by quartz tubes 111, 113 forming conduits from a first side 106 of the transformer-coupled plasma generator plate to a second side 108 of the transformer-coupled plasma generator plate, a first conduit 110 passing through a first transformer core 114.

Shun'ko fails to teach the second conduit not passing through a transformer core.

Smith et al teach a plasma source wherein a single magnetic core 20 is arranged around one of a split line and the other split line is used as return path such that a plasma 14 is circulated through the two split lines (column 5, line 60 through column 6, line 2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the split line mechanism as taught by Smith et al in the apparatus of

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Shun'ko as an art recognized alternative means of returning current through a conduit not containing a second core. See MPEP 2144.06, Art Recognized Equivalent for the Same Purpose, Substituting Equivalents Known for the Same Purpose (in re Fout, 675 F.2d 297, 213 USPQ 532 (CCPA 1982)).

*Further regarding claims 3:* the plate 109 is flat as shown in Figs. 6 and 6a.

*Further regarding claims 4:* the first core 114 having a first primary coil (not shown) and the second core 116 having a second primary coil (not shown) which are connected to a single RF power supply such as that shown in Fig. 7.

*Further regarding claim 5:* the cores 114, 116 comprises ferrite material.

*Further regarding claims 6, 7, 11:* conduits are formed of quartz tubes (*dielectric spacer*); it is the Examiners position that chamber wall (*a remainder of the an outer surface of the generator plat comprising*) is typically made of aluminum (*an electrical conductor*).

*Further regarding claim 8:* an RF power source operates on a relatively low frequency of 60 kHz (column 3, lines 40-62, column 4, line 65 through column 5, line 40).

*Further regarding claim 10:* the apparatus further includes a second conduits 112 passing from the first side to the second side and through a second transformer core 116.

### ***Response to Arguments***

Applicant's arguments filed 6/13/03 have been fully considered but they are not persuasive.

Applicants assert that Mahoney et al do not teach a third conduit not passing through a transformer core.

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The Examiner argues that Mahoney et al further teach a gas input port that may be disposed at an upper part of the conduit and in communication with the vacuum chamber.

Applicants assert that the transformer cores of Mahoney are outside (rather than *within*) the plasma generating chamber.

The Examiner argues that claim 10 does not recite the cores being *within* the chamber. In fact, if claim 10 is not amended in the next office action to include this limitation it would be treat as belonging to non-elected species and would be withdrawn from further consideration.

Applicants assert that combination of Smith et al with Shun'ko do not result in a conduit not passing through a transformer core.

The Examiner argues that Smith et al teach that the return path is simply an opening allowing circulation of the current generated by the transformer core. Thus, the complementing opening in a transformer core system does not require to have another transformer core therearound.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parviz Hassanzadeh whose telephone number is (703)308-2050. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703)308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9310 for regular communications and (703)872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

*P. Hassanzadeh*  
Parviz Hassanzadeh  
Primary Examiner  
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July 16, 2003